1012-P113-WO

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1. Your reference HAR.SEN02

2. Patent application number *(The Patent Office will fill in this part)* 0318380.3 - 5 AUG 2003

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

INTELLIGENT ELECTRICS LIMITED
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BRIDPORT ROAD
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DT2 9DX

Patents ADP number *(if you know it)* 8593831000 2

If the applicant is a corporate body, give the country/state of its incorporation

A BRITISH COMPANY

4. Title of the invention

REMOTE CONTROL

5. Name of your agent *(if you have one)*

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DT4 9TJ

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Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*
~	~	~

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*
~	~

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if*

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

YES

Patents Form 1/77

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Continuation sheets of this form	—
Description	5
Claim(s)	3
Abstract	1
Drawing(s)	2 only

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Priority documents	—
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Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	1
Request for preliminary examination and search *(Patents Form 9/77)*	—
Request for substantive examination *(Patents Form 10/77)*	—
Any other documents *(please specify)*	—

11. I/We request the grant of a patent on the basis of this application.

Signature M Wheller Date 6/8/03

12. Name and daytime telephone number of person to contact in the United Kingdom MICHAEL WHELLER 01305 780565

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REMOTE CONTROL

This invention concerns the remote control of apparatus, especially but not exclusively for reducing power consumed thereby.

In our copending patent application GB 0306940.8 we describe a control system which switches apparatus such as heaters and lights on and off automatically in response to ambient temperature or light level or some other natural variable. Further research now shows benefits in controlling such apparatus in relation to the natural variable, rather than simply switching it on and off.

It is an object of the present invention to improve upon the system of GB Patent Application 0306940.8 in this and other respects.

Thus according to the invention there is provided a system for controlling apparatus, which system comprises a sensor responsive to a natural variable having a changing value, a radio transmitter operatively associated with the sensor to transmit a control signal representative of the value of the natural variable, and a radio receiver arranged remote from the transmitter for receiving the control signal, wherein the system includes a controller operable by receipt of the control signal to control the apparatus according to the value of the natural variable.

Preferably the controller is operative to change a parameter of the apparatus as the value of the natural variable changes, eg in proportion thereto.

The parameter may be changed in direct relation to the value of the natural variable. However there are many applications of the present invention in which it is beneficial rather to changed the parameter in inverse relation to the value of the natural variable: thus, for instance, output from lamps may be increased automatically as ambient light value falls, or output from heaters may be increased automatically as ambient tempetature falls.

Whilst the parameter might be changed continuously, we have found that in practice it is sufficient – and more easily implemented – if the parameter in a plurality of steps.

Also, whilst GB Patent Application 0306940.8 referred to control signals in the 433 MHz band, the present invention is designed for the 868 MHz band.

The invention will now be described by way of example only with reference to the accompanying schematic drawing, in which –

Figure 1 shows a diagrammatic plan view of an office with central heating radiators controlled automatically by means of the invention and

Figure 2 shows a circuit diagram for the control of fluorescent light fittings controlled by means of the invention.

Referring first to Figure 1, this shows a floor of a hotel indicated generally at 110 and comprising a plurality of rooms 112 each provided with a radiator 114 of a central heating system (not otherwise detailed, for simplicity of illustration) whereby the rooms 112 are heated. The hotel 110 has an entrance lobby 116 furnished in the usual way with a reception desk 118. Behind the desk 118, and

therefore out of the way of guests, is a radio transmitter 120 operatively associated with a temperature sensor 122. The transmitter operates in the 868 MHz band.

Each of the radiators 114 is adjustable by means of an opening and closing valve 114a, in the usual way save that each valve is operated by a 0-10V dc stepper motor 114b. The stepper motors 114b are themselves controlled by radio receivers 114c in communication with the transmitter 120. If there is a fall in the temperature detected by the sensor 122, the transmitter 120 transmits to the receivers 114c a signal representative of the lower temperature, and this causes the stepper motors 114b to turn the radiator valves 114a towards (or further towards) their open position. Similarly, if there is a rise in the temperature detected by the sensor 122, the transmitter 120 transmits to the receivers 114c a signal representative of the higher temperature, and this causes the stepper motors 114b to turn the radiator valves 114a towards (or further towards) their closed position. Thus the heat output of the radiators 114 is varied in inverse relation to the sensed temperature.

The signal from the transmitter 120 may be an analogue representation of the sensed temperature, but in many cases it is sufficient and more convenient for the signal to be a step-wise approximation of the temperature.

Figure 2 illustrates another use of the invention. It shows two remotely controlled fluorescent light fittings indicated in broken lines at 210 and 212. (As indicated in Figure 2, there may be more light fittings similarly controlled). The

two fittings 210 and 212 are of different sizes, fitting 210 comprising a single controllable tube (not detailed) and fitting 212 comprising two individually controllable tubes. The light outputs of the tubes are varied by means of 0-10V dimming ballasts 214 of well known form, which ballasts are operatively connected to radio receivers 216. The light fittings 210 and 212 are powered from live L and neutral N mains supply lines, the live L line including a switch 218 providing overall control.

Provided the switch 218 is closed to complete the live L supply, the light fittings 210 and 212 are remotely controlled as will now be described in more detail. A photometer 220 is arranged, remote from the light fittings 210 and 212, in such a position as to detect ambient light. A radio transmitter 222 communicating with the receivers 216 in the 868 MHz band is connected to the photometer 220 and transmits to the receivers 216 control signals representative of the light level detected by the photometer 220. If there is a fall in the ambient light level as detected by the photometer 220, the transmitter 222 transmits to the receivers 216 a signal representative of the lower light level, and this causes the dimming ballasts 214 to increase the light output from the fittings 210 and 212. Similarly, if there is a rise in the light level detected by the photometer 220, the transmitter 222 transmits to the receivers 216 a signal representative of the higher ambient light level temperature, and this causes the dimming ballasts 214 to decrease the light output from the fittings 210 and 212. Thus the light output of the fittings 210 and 212 is varied in inverse relation to the ambient light level.

The signal from the transmitter 222 may be an analogue representation of the ambient light level, but in practice step-wise adjustment over say 100 or more steps makes adjustment of the light output imperceptible to users.

CLAIMS

1 A system for controlling apparatus, which system comprises a sensor responsive to a natural variable having a changing value, a radio transmitter operatively associated with the sensor to transmit a control signal representative of the value of the natural variable, and a radio receiver arranged remote from the transmitter for receiving the control signal, wherein the system includes a controller operable by receipt of the control signal to control the apparatus according to the value of the natural variable.

2 A system for controlling apparatus as claimed in Claim 1 wherein the controller is operative to change a parameter of the apparatus as the value of the natural variable changes.

3 A system for controlling apparatus as claimed in Claim 2 wherein the controller is operative to change said parameter proportionately as the value of the natural variable changes.

4 A system for controlling apparatus as claimed in Claim 2 or Claim 3 wherein said parameter is changed in direct relation to the value of the natural variable.

5 A system for controlling apparatus as claimed in Claim 2 or Claim 3 wherein said parameter is changed in inverse relation to the value of the natural variable.

6 A system for controlling apparatus as claimed in Claim 5 wherein the apparatus comprises one or more lamps of which said parameter is the light output thereof.

7 A system for controlling apparatus as claimed in Claim 6 wherein the sensor comprises a photometer and the system is arranged to increase the light output from the lamps as incident light on the photometer decreases.

8 A system for controlling apparatus as claimed in Claim 6 or Claim 7 wherein the controller comprises an adjustable ballast.

9 A system for controlling apparatus as claimed in Claim 5 wherein the natural variable is temperature.

10 A system for controlling apparatus as claimed in Claim 9 wherein the apparatus comprises one or more heaters of which said parameter is the heat output thereof.

11 A system for controlling apparatus as claimed in Claim 10 wherein the sensor comprises a thermometer and the system is arranged to increase the heat output from the heaters as ambient temperature at the thermometer decreases.

12 A system for controlling apparatus as claimed in any of Claims 2 to 11 wherein said parameter is changed in a plurality of steps.

13 A system for controlling apparatus as claimed in any preceding claim wherein the control signal is a radio signal in the 868 MHz band.

14 A system for controlling apparatus substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

ABSTRACT

REMOTE CONTROL

A hotel floor 110 comprises rooms 112 each provided with a central heating radiator 114 having a valve 114a adjustable by means of a 0-10V dc stepper motor 114b. In the hotel lobby 116 a sensor 122 for ambient temperature is connected to a radio transmitter 120and radio receivers 114c are connected to the stepper motors 114b in each room 112. If the ambient temperature falls, the transmitter 120 transmits to the receivers 114c a signal representative of the lower temperature, and the stepper motors 114b open the valves 114a. If the temperature rises, the transmitter 120 transmits to the receivers 114c signals the higher temperature, and the stepper motors 114b close the valves 114a. Thus the heat output of the radiators 114 is varied in inverse relation to the ambient temperature. The system may be adapted to control lighting fittings by way of dimming ballasts.

[Use Figure 1]

1/2

Fig 1

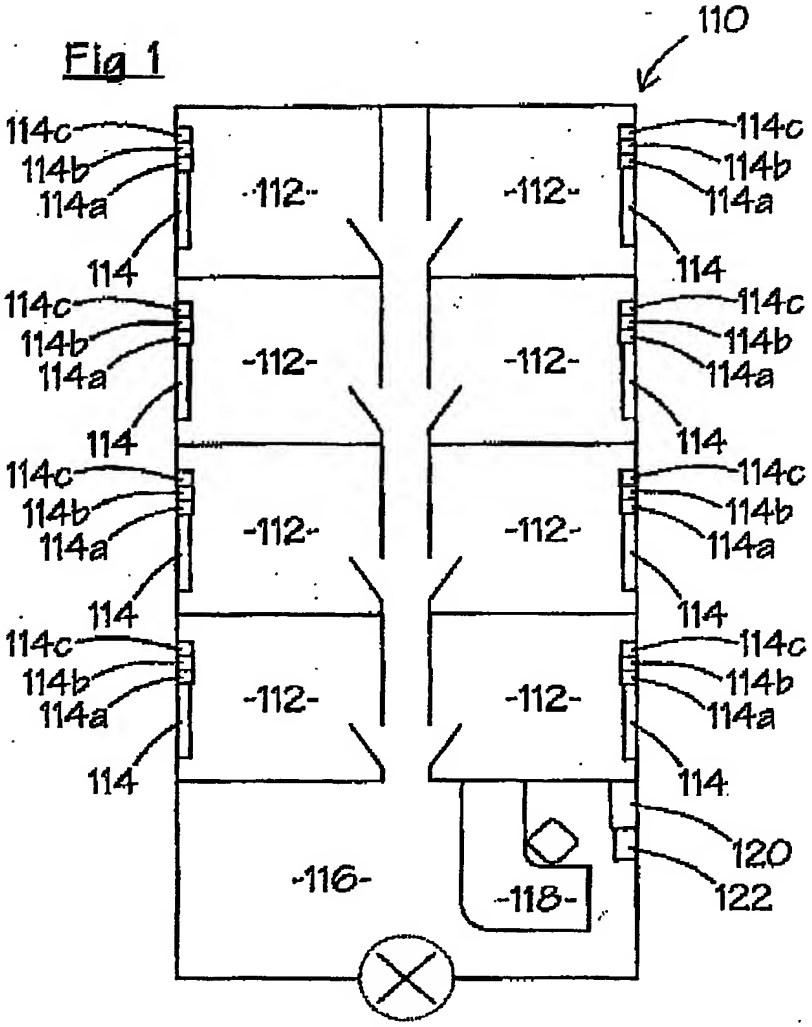
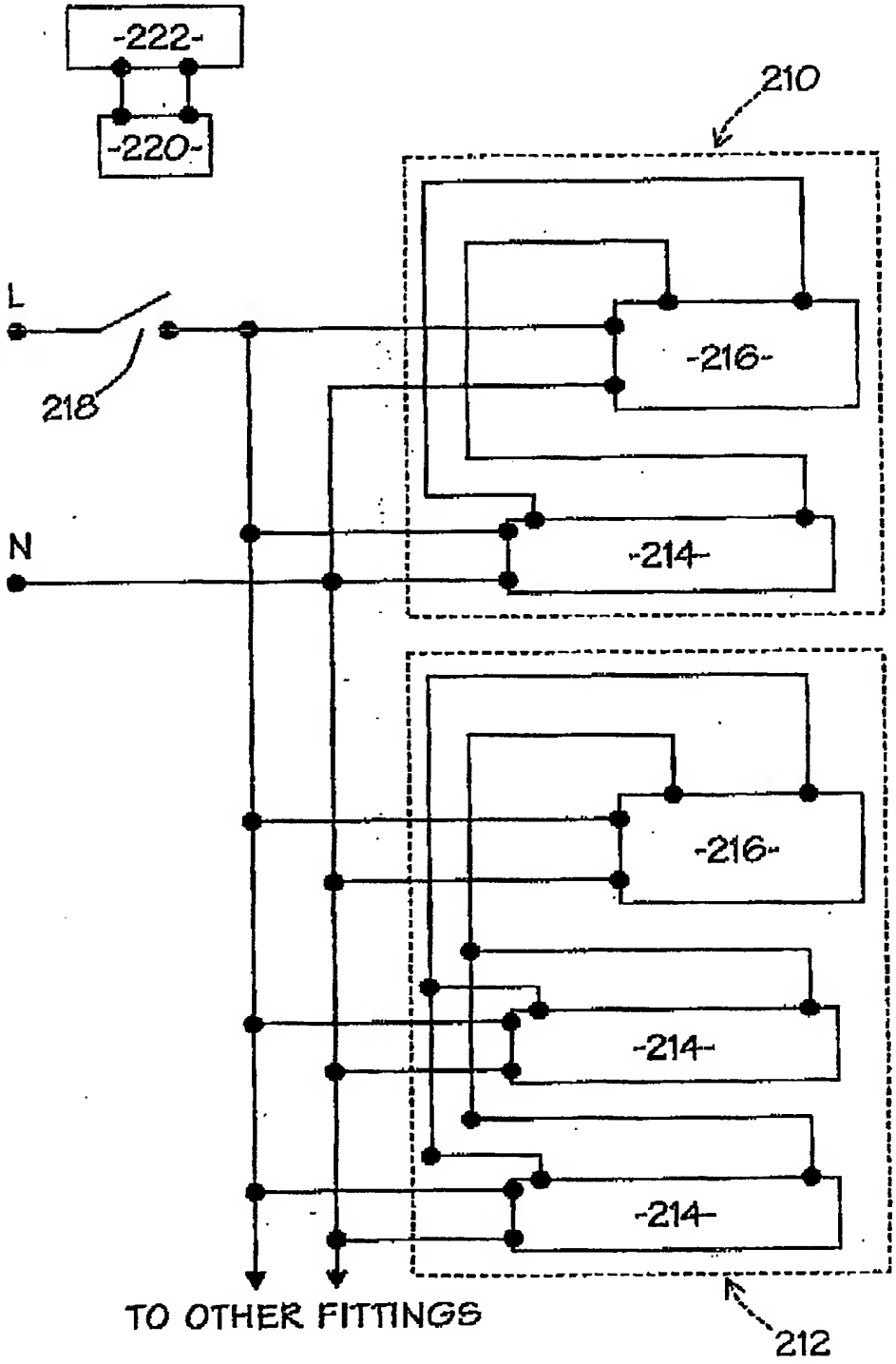


Fig 2



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